Data Aggregation Best Practices

Northeast Energy Efficiency Partnerships

Introduction

Building data aggregation is the act of compiling building energy data into one place where it can be viewed and used to understand energy usage and to drive energy efficiency measures. The first step towards aggregating data is having the necessary data accessible, and this is where building energy benchmarking comes in. Benchmarking – the act of measuring building energy and targeting ways to reduce energy consumption – creates opportunities for improved efficiency and provides a way to set baselines for building energy performance standards. Accessible energy usage data can open up an endless number of doors for tenants, utility providers, and building owners to better manage energy consumption, which leads to monetary savings and a number of environmental and health benefits. In addition, local governments can use aggregated data for city planning purposes to reduce total energy consumption and become greener as a community.

When considering a benchmarking policy, transparency and data access are critical. Building owners need access to data but are often prohibited from accessing energy information for tenant-occupied spaces, where tenants are utility customers on record. One way to gain access is to set a data aggregation threshold to simplify the tenant authorization process. Through this pathway, utilities provide building owners with aggregated energy usage information without the need for individual tenant authorization.[1]

Data Aggregation Best Practices

The most important aspect of creating data aggregation policies is to individualize efforts based on target community. Based on the size, building stock, and other characteristics of the area's specific grid, policies may need to outline more flexible or more stringent standards on how tenants are required to disclose aggregated energy data with their building owners. The main goal of a building aggregation policy is finding a threshold that will incorporate the greatest number of buildings without putting the privacy of tenants at risk. Many communities find that having a low threshold like an energy consumption percentage threshold per unit is a great way to maintain customer privacy in multi-tenant buildings. This is one of the many considerations involved in crafting the appropriate policy. Broadly speaking, the lower the threshold, the more buildings available for capture within the policy framework. However the lowest threshold is not always best for every area. Analyzing the building stock, local needs, and policy goals is extremely important to find the right threshold that can incorporate a maximum number of buildings.

In addition to setting up a foundation for data aggregation within the community via a bill or law, it is equally important to direct community members to the proper resources that allow them to perform the actual data

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[1] DOE Better Buildings, Energy Data Accelerator, Best Practices for Providing Whole-Building Energy Data: A Guide for Utilities, January 2016, Available at: https://betterbuildingssolutioncenter.energy.gov/sites/default/files/attachments/Best%20Practices%20for%20Providing%20Whole-Building%20Energy%20Data%20-%20Guide%20for%20Utilities.pdf

collection. U.S. EPA's ENERGY STAR Portfolio Manager is a user-friendly, free tool that can be used to track and improve the energy efficiency of any property. After a building owner has input their building's data, it is organized and uploaded into the tracking software. Portfolio Manager normalizes the energy data inputs from the user according to weather records and building usage information, and generates a statement of performance detailing a building's Energy Use Intensity (EUI).[2] Energy Use Intensity is the amount of energy used by a building per square foot each year, often expressed in kBtu/sf/yr. The EUI of a building can be used to compare it to peer buildings, allowing a better understanding of relative overall building energy efficiency.[3] In the end, no matter what threshold is enacted to encourage energy efficiency measures, it is extremely important that customer data is kept confidential. This can be done in a number of ways, including aggregating customer data from the meter level to the building level.A great way to start thinking about an aggregation threshold is to examine the established thresholds of other communities. The table below outlines the aggregation thresholds of various building stocks and population densities.

Table 1. Aggregation Threshold Examples Based on Building Stock and Size

Jurisdiction	Utility Company	Aggregation Thresholds	Building Stock (All housing types not mentioned account for <10%)	Size and Population
Greater Austin Area, Texas	Austin Energy	4/80%	50% single unit detached, 20% 20+ units.	2.17 million people in 4,278 square miles.
New York City	Consolidated Edison and PSEG Long Island	2	41.7% single unit detached, 22.9% 20+ units, 10.9% two units.	8.4 million people in 302.6 square miles.
Boston, MA	Eversource and National Grid	4/50%	26% 3-4 units, 21.5% 20+ units, 14.6% two units, 11.7% single unit detached, 11.6% 5-9 units.	685,000 people in 89.63 square miles.
Washington DC	Pepco	5	31.1% 10-19 units, 26.1% single unit attached, 13.9% 5-9 units, 13.4% 3-4 units.	682,000 people in 68.3 square miles.
Vermont	Statewide	4	69.8% single unit, 16.7% 3+ units.	626,000 people in 9,616 square miles.

For further aggregation threshold examples see: Better Buildings Data Accelerator[4]

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[2] In this context, the term "normalized" means adjusting energy usage data to account for higher or lower heating and cooling requirements based on an individual year's weather relative to a recent historical average, or how the building would have performed had external climactic conditions been the same.

[3] United States Environmental Protection Agency's ENERGYSTAR.gov website. *What is Energy Use Intensity (EUI)?* Accessed: 7/30/19. Available at: http://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager/understand-metrics/what-energy

[4] DOE Better Buildings, Energy Data Accelerator, Best Practices for Providing Whole-Building Energy Data: A Guide for Utilities, January 2016, Available at: https://betterbuildingssolutioncenter.energy.gov/sites/default/files/attachments/Best%20Practices%20for%20Providing%20Whole-Building%20Energy%20Data%20-%20Guide%20for%20Utilities.pdf

Aggregation Threshold Exemplar

New York State

Energy efficiency has consistently proved to be a pathway towards reaching carbon reduction goals in an inexpensive and effective way. The state of New York has recently been making critical efforts towards achieving its goal of 80 percent carbon reduction by 2050. In addition to building energy codes, stretch codes, home efficiency upgrades, and more, New York has been working towards crafting ambitious data aggregation thresholds to meet their energy goals.

Enabling access to building energy data is a critically important aspect of managing building energy usage. While discussions of energy data access often raise valid privacy concerns in the multi-tenant market segment, providing building owners with aggregated and anonymized whole building energy usage data is becoming the accepted solution for these concerns. In order to alleviate concerns in such a scenario, most utilities offering aggregated and anonymized data require tenant consent if a building has: (1) a small number of tenants; and/or (2) no single tenant uses a significant proportion of the building's energy.

In an attempt to grant public access to information previously only given to utility companies, New York introduced a bill on whole building data aggregation standards. Not only would this allow customers to make informed decisions regarding the housing market, but it also promotes larger goals of energy transparency and working towards becoming more energy efficient. Through analysis of their own building energy usage, citizens are also able to understand how they can make improvements within their systems to better their energy efficiency and, in turn, save money.

The first attempt at this was a 15/15 privacy standard for general use by utilities, which was proposed by the Joint Utilities in New York. Although ensuring protection of resident privacy, a 15/15 energy data standard is extremely restricting because only buildings with 15 or more units and no single unit consuming more than 15 percent of the total building's energy usage can be incorporated.[5] This highly limits the number of buildings involved because it is so conservative. After rejecting this proposal, The Commission looked into a 4/50 standard, which would include any buildings with more than four units and no one unit accounting for over 50 percent of the total building energy use. This standard would include a greater number of buildings while still protecting the privacy of individual tenants through secure access to information and a consent-driven sharing

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[5] State of New York Public Service Commission. Accessed: 7/30/19. Available at:
http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=2ahUKEwi_tp_V59zjAhUsw1kKHZwUAcwQFjAAegQIAhAC&url=http%3A%2F%2Fdocuments.dps.ny.gov%2Fpublic%2FCommon%2FViewDoc.aspx%3FDocRefId%3D%257B4C4CE28E-54CC-4514-967D-B513678E3F37%257D&usg=AOvVaw2l-jp2ELbAEZ3miqpzIalf

process. The 4/50 standard is also especially helpful to buildings that encompass both apartment units and a storefront because the 50 percent threshold protects the storefront's greater energy usage.[6]

In addition to creating aggregation thresholds, the commission has also adopted a Utility Energy Registry (UER), which, according to the order, will be an online platform to provide streamlined public access to aggregated community-scale utility energy data. The UER is intended to promote and facilitate community-based energy planning and energy use awareness and engagement.[7] The utilities are required to upload the datasets every six months (January to June and July to December) within 30 days of the close of each semi-annual period to the UER.

Taking steps to enable data access for whole building energy usage and creating a platform to provide public access to community-scale data will enable transparency as the state begins to implement the strategies that are outlined in the Governor's New Efficiency New York Plan.

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[6] Rethinking Energy Data Access. Accessed: 7/30/19. Available at: https://www.imt.org/wp-content/uploads/2019/01/IMT_RethinkingEnergyDataAccess.pdf.

[7] New York State NYSERDA. *Community Energy Use Data.* Accessed: 7/30/19. Available at: https://www.nyserda.ny.gov/All-Programs/Programs/Clean-Energy-Communities/Community-Energy-Use-Data.